

AMENDMENTS TO THE CLAIMS

1. (Previously Presented) A power train for a motor vehicle, said power train comprising a combustion engine with a driving shaft turning at a first rpm rate, at least one torque-coupling device, a transmission with a transmission input shaft, and an electro-mechanical energy converter with a stator and with a rotor and an energy-converter shaft turning at a second rpm rate, said electro-mechanical energy converter being operable as a motor and as a generator and having an interactive rotary connection to the driving shaft; wherein the electromechanical energy converter is operable in a first mode in which the torque flows from the electro-mechanical energy converter to the combustion engine, and a second mode in which the torque flows from the combustion engine to the electro-mechanical energy converter; wherein the interactive rotary connection automatically sets itself to one of at least two rpm ratios depending on whether the electro-mechanical energy converter is working in the first or second mode, said rpm ratios being defined as quotients of the first rpm rate divided by the second rpm rate; wherein the interactive rotary connection comprises at least one rotary transfer device arranged between the electro-mechanical energy converter and the combustion engine; and wherein the at least one rotary transfer device comprises a planetary gear mechanism with at least one ring gear, at least one sun gear, and at least one planet carrier with at least one planet gear.
2. (Original) The power train of claim 1, wherein the driving shaft has a front end facing away from the transmission and the interactive rotary connection is arranged at said front end.

Amendment dated

After Final Office Action of August 25, 2005

3. (Original) The power train of claim 1, wherein the interactive rotary connection comprises at least a pair of sheaves and an endless-loop device coupling the sheaves to each other by frictional contact.
4. (Original) The power train of claim 3, wherein each sheave comprises a belt-drive pulley and the endless-loop device comprises a belt.
5. (Original) The power train of claim 1, wherein the electro-mechanical energy converter serves as a starter motor for the combustion engine.
6. (Original) The power train of claim 1, wherein the electro-mechanical energy converter is used to propel the motor vehicle.
7. (Original) The power train of claim 1, wherein during a start-up phase of the combustion engine the second rpm rate is higher than the first rpm rate.
8. (Original) The power train of claim 1, wherein the rpm ratio for the first mode is smaller than the rpm ratio for the second mode.
9. (Withdrawn) The power train of claim 3, wherein the interactive rotary connection comprises a fixed-ratio rotary transfer stage formed by a belt drive with pulleys of different diameters.
10. (Original) The power train of claim 1, wherein the rotary transfer device comprises a housing and the at least one ring gear is connected and thereby rotationally coupled to the housing.

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11. (Original) The power train of claim 1, wherein the at least one rotary transfer device further comprises a first clutch located in a first torque flow path that is operative under the first mode, and a second clutch located in a second torque flow path that is operative under the second mode, and wherein the first clutch is engaged in the first mode and disengaged in the second mode, while the second clutch is engaged in the second mode and disengaged in the first mode.
12. (Withdrawn) The power train of claim 11, wherein the first clutch and the second clutch are overrunning clutches.
13. (Original) The power train of claim 11, wherein the at least one rotary transfer device comprises a planetary gear mechanism with a ring gear, a sun gear, and a planet carrier with at least one planet gear, wherein under the first mode the electro-mechanical energy converter drives the sun gear which, in turn, drives the planet carrier through the at least one planet gear, and the planet carrier drives the combustion engine; and wherein under the second mode, the combustion engine drives the planet carrier with the at least one planet gear which, in turn, drives the electro-mechanical energy converter through the sun gear.
14. (Original) The power train of claim 11, wherein the at least one rotary transfer device comprises a first gear pair and a second gear pair, wherein under the first mode the electro-mechanical energy converter drives the combustion engine through the first clutch and the first gear pair; and wherein under the second mode, the combustion engine drives the electro-mechanical energy converter through the second clutch and the second gear pair.

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15. (Original) The power train of claim 11, wherein the rotary transfer device has first transfer elements that determine the first rpm ratio and wherein the first clutch is placed in the torque flow path at one of an upstream location and a downstream location relative to the first transfer elements.
16. (Original) The power train of claim 11, wherein the rotary transfer device has second transfer elements that determine the second rpm ratio and wherein the second clutch is placed in the torque flow path at one of an upstream location and a downstream location relative to the second transfer elements.
17. (Original) The power train of claim 1, wherein the interactive rotary connection comprises a rotary vibration damping device with energy-storing elements allowing the driving shaft and the energy converter shaft to rotate in relation to each other within a limited range against an opposing torque of the energy-storing elements.
18. (Original) The power train of claim 1, wherein the interactive rotary connection comprises a rotary shock/vibration absorbing device.
19. (Original) The power train of claim 3, wherein at least one of a rotary vibration damping device and a rotary shock/vibration absorbing device is arranged radially inside one of a belt-drive pulley and the rotor.
20. (Original) The power train of claim 1, wherein at least one of a rotary vibration damping device and a rotary shock/vibration

absorbing device is arranged on one of the driving shaft and the energy-converter shaft.

21. (Original) The power train of claim 1, wherein the ring gear, the planet gears, and the sun gear comprise a helical tooth profile; wherein under the first mode, the helical tooth profile pushes the ring gear in a first axial direction where the ring gear becomes locked to a non-rotating component; and wherein under the second mode, the helical tooth profile pushes the ring gear in a second axial direction where the ring gear becomes locked to the planet carrier.
22. (Previously Presented) The power train of claim 21, wherein the first mode is a start-up mode, wherein a first rpm ratio of the at least two rpm ratios is normally reserved for the start-up mode, and wherein the rotary transfer device has a ratio-locking means which, at rpm rates exceeding those required for the start-up mode, prevents the rotary transfer device from shifting out of the first rpm ratio.
23. (Original) The power train of claim 21, wherein the ratio-locking means comprises at least one centrifugal body arranged at an external circumference of the planet carrier, and wherein a centrifugal force drives the centrifugal body into form-locking engagement with a recess at an internal circumference of the ring gear.
24. (Original) The power train of claim 23, wherein the at least one centrifugal body has a spherical shape.

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25. (Original) The power train of claim 21, wherein the ring gear has axially engaging coupler means for coupling the ring gear to one of the non-rotating component and the planet carrier.
26. (Original) The power train of claim 25, wherein the coupler means comprise at least one of a Hirth coupler, a dog clutch, and a friction clutch.